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MEMORANDUM

SUBMITTED TO: Barbara Lee, EPA Project Officer

PREPARED BY: Kate Dragolovich, E & E START

DATE: January 27, 2000

SITE: Victoria Golf Course
Carson, Los Angeles County, California

EPA ID NUMBER: CAD980818926

TDD: 09-99-11-0004

PAN: 0490VGSTXX

SUBJECT: Victoria Golf Course ESI: Identification of Most Likely HRS Scoring
Scenario(s), HRS Data Gaps, and Proposed Additional
Information/Sampling Needs

CC: Rachel Loftin, EPA Task Monitor

The U.S. Environmental Protection Agency (EPA) has tasked Ecology and Environment, Inc.'s (E & E's) Superfund Technical Assessment and Response Team (START) to conduct an Expanded Site Inspection (ESI) at the Victoria Golf Course (VGC) site. As the first step in this process, E & E identified the most likely Hazard Ranking System (HRS) scoring scenario(s), HRS data gaps, and additional information/sampling needs. This memorandum summarizes our findings.

Site Description

The VGC site occupies 348 acres in a mixed recreational, commercial, residential, and industrial area of Carson, Los Angeles County, California. The location of the site is shown in Figure 1. The Towne Avenue Elementary School is located to the north of the site immediately across 192nd Street. The Towne Avenue Elementary School has received recent news coverage, due to public concern over cancer rates among teachers at the school.

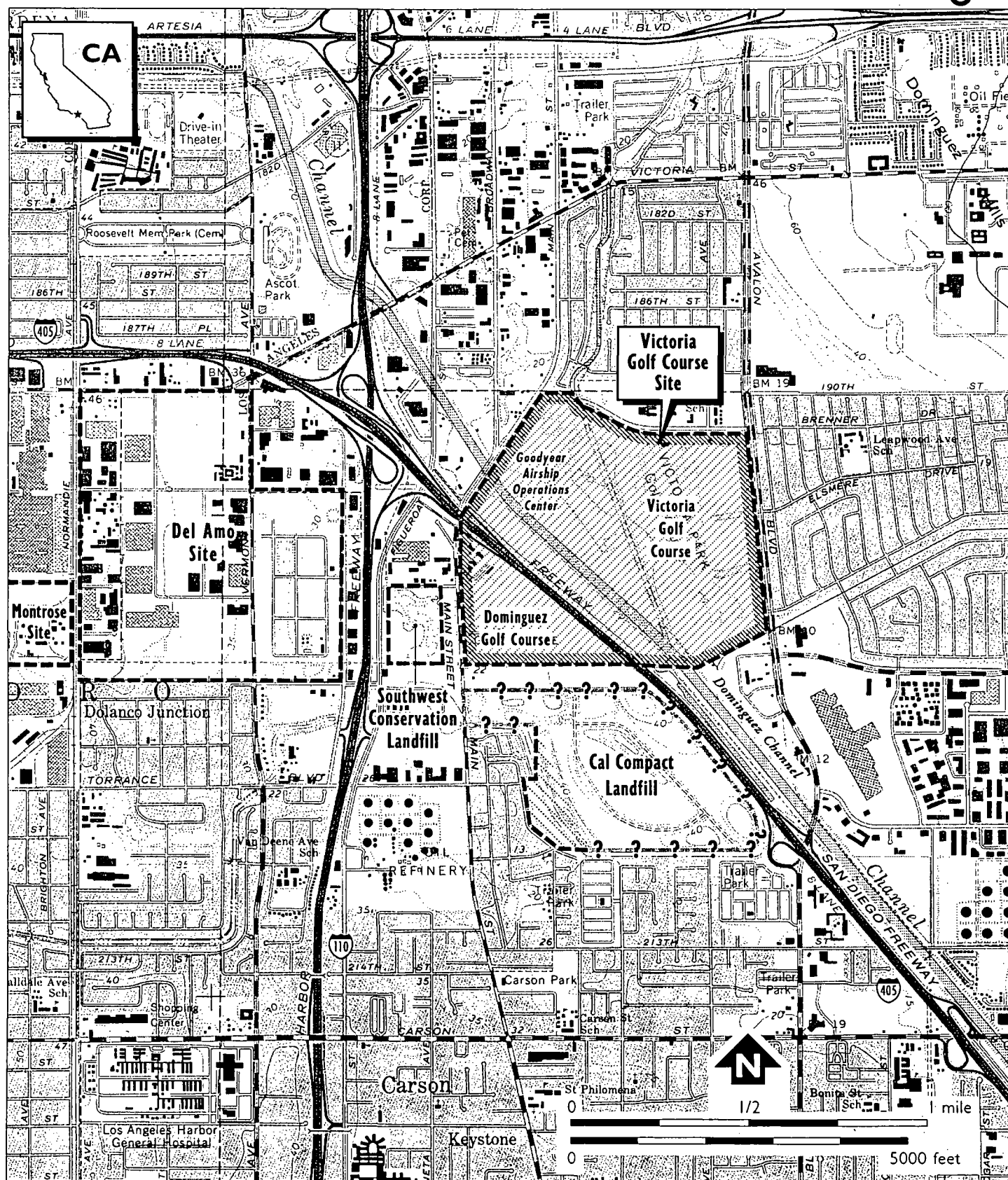
From 1948 to about 1959, the Ben K. Kazarian (BKK) Corporation operated a Class II cut-and-cover landfill on the portion of the site located to the northeast of the current San Diego Freeway (Interstate 405). The landfill, which was known as the BKK Carson Dump, was permitted to accept household and industrial wastes. From 1953 to 1955, BKK Corporation leased the portion of the site to the southwest of the current San Diego Freeway from the Dominguez Land Company. This area was used as a public dump.

The site is currently occupied by the following facilities:

- Victoria Regional Park, which occupies approximately 200 acres in the eastern portion of the site. The park is owned by the County of Los Angeles, Department of Parks and Recreation (LA County DPR), and consists of the Victoria Golf Course, tennis courts, picnic areas, ball fields, and open space.
- Goodyear Airship Operations, which is located in the northwest corner of the site and owned by Goodyear Tire and Rubber Company.
- Dominguez Golf Course, which is located in the southwest corner of the site and owned by the Watson Land Company and the Dominguez Properties.
- Don Dominguez Apartments, which are also located on property owned by the Watson Land Company.
- Jaeil Farms, which is a small family-run vegetable growing operation also located on property owned by the Watson Land Company.

Most Likely HRS Scoring Scenario(s) and HRS Data Gaps

The attached HRS Scoring Analysis Matrix shows how the use of various data may impact the overall site score. Scenario #1 was prepared by E & E for the August 1998 ESI report, for which data were provided by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). Scenario #2 was prepared by Bechtel Environmental, Inc. (BEI) for the March 1994 Site Inspection Prioritization (SIP) report. The other scenarios in the matrix were generated by E & E for this memorandum to present permutations of particular HRS factors



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Figure 1

SITE LOCATION MAP
Victoria Golf Course Site
 Carson, California

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and their effects on the overall site score.

Scenarios #6, #8, and #9 appear to be the most likely HRS scoring scenarios for the VGC site. Scenario #6, which yields an overall site score of 50, is based on obtaining data to document an observed release to groundwater, obtaining data to assign a toxicity/mobility factor value of 10,000, and confirming a targets factor category value of 754.7. Scenario #8, which also yields an overall site score of 50, is based on delineating the boundaries of the source(s), obtaining data to document an observed release to air within the boundaries of the source(s), obtaining data to assign a toxicity/mobility factor value of 10,000, and confirming the presence of 268 residents and workers within the boundaries of the source(s) (i.e., within the "on a source" distance ring). Scenario #9, which also yields an overall site score of 50, is based on documenting an observed release to air not only within the "on a source" distance ring, but within the "0- to 0.25-mile" distance ring. The approximately 500 students and teachers associated with Towne Avenue Elementary School are potentially located in the latter distance ring.

Scenarios #6, #8, and #9 are discussed in detail below.

Scenario #6 (Groundwater Pathway)

- Observed Release to the Bellflower Aquifer: In January 1997, the DTSC, under contract to the EPA, conducted a Hydropunch™ groundwater sampling effort at the VGC site. The eight sampling locations (GW-1, GW-2, GW-3, GW-4, GW-5, GW-8, GW-9, and GW-10) are shown in Figure 2. As presented in Table 1, results of this effort indicated that several volatile organic compounds (VOCs) [i.e., vinyl chloride, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethene (1,2-DCE), 1,2-dichloroethane (1,2-DCA), trichloroethene (TCE), and chlorobenzene] were present in groundwater samples collected from the Bellflower aquifer beneath the southwest portion and immediately to the south of the VGC site (sampling locations GW-1, GW-9, and GW-10) at concentrations significantly above the levels reported at the two designated "background" locations (GW-3 and GW-4) along the northern boundary of the site. VOCs were not detected or detected at concentrations below Contract Required Quantitation Limits (CRQLs) at sampling locations GW-3 and GW-4, as well as the three remaining sampling locations in the north and northeast portions of the site (GW-2, GW-5, and GW-8). Semivolatiles and metals were not detected at elevated levels at any of the eight groundwater sampling locations. As discussed in the following two paragraphs, in the absence of site-specific groundwater gradient data and the presence of possible alternate contributors, the 1997 DTSC VOC groundwater analytical data are not sufficient to document an observed release attributable, at least in part, to the VGC site.

On a regional basis, groundwater flow direction in the Bellflower aquifer has been shown to be variable. As shown in Figure 1, the Del Amo site is located approximately 0.25 mile west of the VGC site. As reported in the May 15, 1998 Del Amo Study Area Final

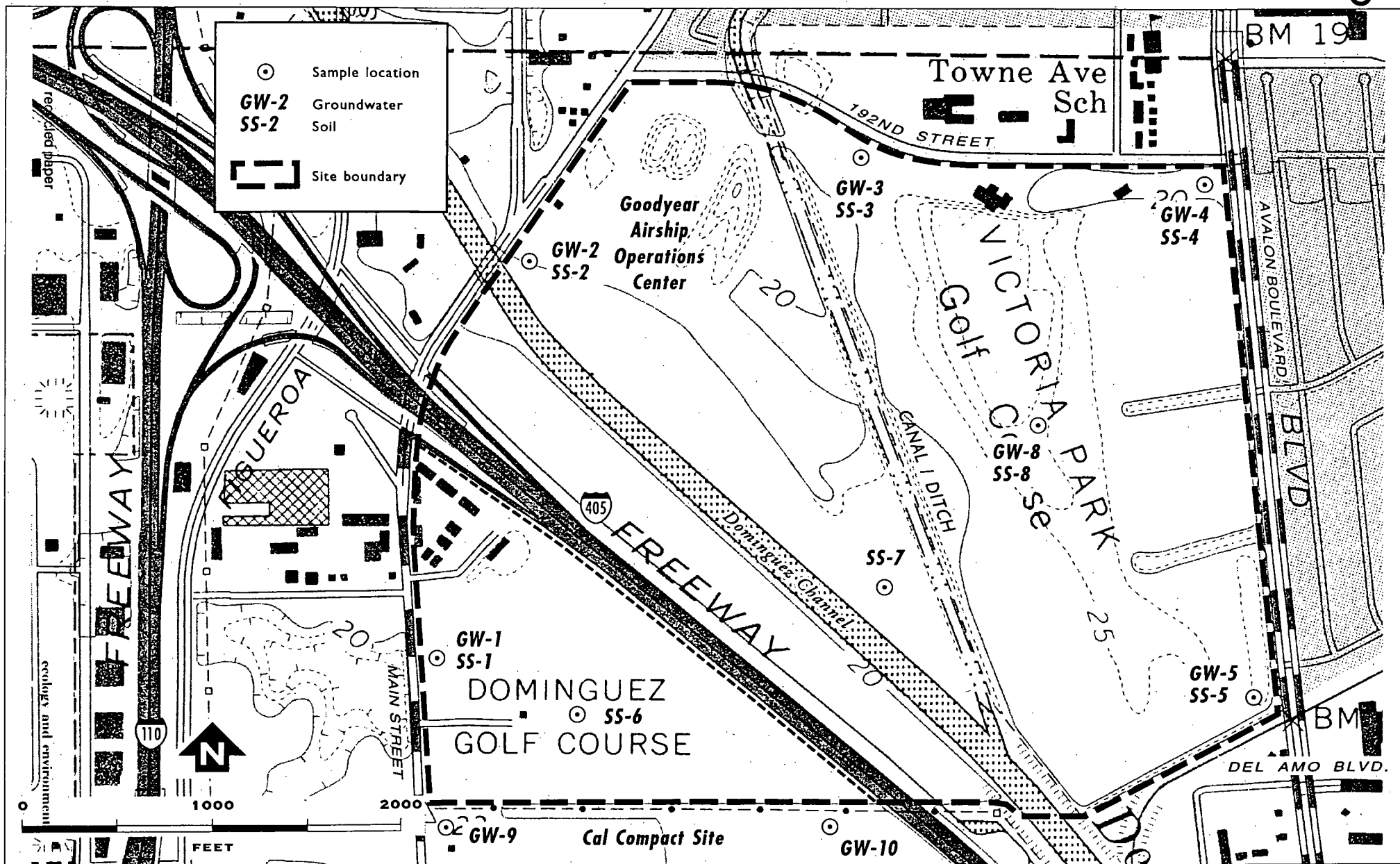


Figure 2 **1996 and 1997 Sampling Locations**
Victoria Golf Course Site
Carson, California

Table 1: 1997 DTSC Hydropunch™ Groundwater Sample Results, Victoria Golf Course
(All results in $\mu\text{g/kg}$)

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Sample No.	Analyte							
	Vinyl Chloride	Acetone	1,1-Dichloroethane	1,2-Dichloroethene	1,2-Dichloroethane	Trichloroethene	Tetrachloroethene	Chlorobenzene
GW-1-1	25	11G	8JA	48	78	13	ND (10)	10
GW-2	ND (10)	2JAG	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
GW-3-1 "Background"	ND (10)	ND (10)	ND (10)	3JA	ND (10)	ND (10)	ND (10)	ND (10)
GW-4-1 "Background"	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
GW-5-1	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
GW-8-1	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
GW-9	4JA	ND (10)	ND (10)	5JA	ND (10)	16	ND (10)	ND (10)
GW-10-1	23	3JAG	ND (10)	72	4JA	27	4JA	13
GW-17-1 (Duplicate of GW-8-1)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
GW-28-1 (Duplicate of GW-5-1)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)

ND = Not detected; sample quantitation limits in parentheses.

$\mu\text{g/kg}$ = micrograms per kilogram.

Bold and Shaded = indicate results significantly above "background" concentrations ("background" as designated by DTSC).

J = Analyte was positively identified, but associated numerical value is an approximate concentration.

A = Result is below the Contract Required Quantitation Limit (CRQL).

G = Analyte may be an artifact, since it is commonly found as a field and laboratory contaminant.

Groundwater Remedial Investigation (RI) report, which was prepared by Dames & Moore, data developed during the Del Amo Groundwater RI allows for subdivision of the Bellflower aquifer into three discrete hydrostratigraphic units based on the predominance of muddy (i.e., dominated by clay, silt, and very fine sand) or sandy (i.e., dominated by fine to medium sand) lithotypes. The Upper Bellflower unit is predominantly muddy, with an average thickness of 74 feet and a generally south-southwest groundwater gradient. The Middle Bellflower unit is predominantly sandy, with an average thickness of 65 feet and a generally south-southeast groundwater gradient. The Lower Bellflower unit is predominantly muddy, with an average thickness of 27 feet and a southerly groundwater flow direction. Since groundwater flow direction data have not been collected for the VGC site, it is not known whether the two designated "background" locations for the 1997 Hydropunch™ groundwater sampling event (GW-3 and GW-4) are hydraulically upgradient or crossgradient.

A number of contributors to regional VOC groundwater contamination were identified in the 1998 Del Amo Study Area Final Groundwater RI report. At least two of these may be alternate contributors to the VOC contamination reported in groundwater beneath the southwest portion and immediately to the south of the VGC site. As shown in Figure 1, the Southwest Conservation Landfill is located immediately to the west of the southwest portion of the VGC site. As reported in the 1998 Del Amo Study Area Final Groundwater RI report, the same VOCs detected in Hydropunch™ groundwater samples at the VGC site (GW-1, GW-9 and GW-10) have been detected in groundwater monitoring wells associated with Southwest Conservation Landfill (see the attached Figures 5.3-1, 5.3-3, and 5.3-4, which were prepared by Dames & Moore for the 1998 Del Amo Study Area Final Groundwater RI report). If the gradient of the subunit of the Bellflower aquifer that was sampled during the 1997 DTSC event is toward the southeast, the reported VOC contamination at Hydropunch™ sampling locations GW-1, GW-9, and GW-10 may be due wholly to the Southwest Conservation Landfill. In addition, the Cal Compact Landfill is located immediately to the south of the VGC site, which makes the source of the reported VOC contamination at Hydropunch™ sampling locations GW-9 and GW-10 even more unclear. Based on the 1997 DTSC groundwater data, it appears that the presence of alternate contributors to the north and east of the VGC site is unlikely. VOCs were either not detected or detected at concentrations less than CRQLs in groundwater samples collected from the five sampling locations in the northeastern portion of the site (GW-2, GW-3, GW-4, GW-5, and GW-8).

- Toxicity/Mobility Factor Value of 10,000: The November 1992 HRS Guidance Manual allows for hazardous substances to be associated with a source if the hazardous substances are in a release from the source (see page 45 of the HRS Guidance Manual). Results of the January 1997 Hydropunch™ groundwater sampling effort indicated that vinyl chloride, 1,1-DCA, 1,2-DCE (total), 1,2-DCA, TCE, and chlorobenzene were present in groundwater samples collected from beneath the southwest portion and immediately to the

south of the VGC site at concentrations significantly above levels in groundwater beneath the northern boundary of the site. However, as discussed previously, due to the absence of site-specific groundwater flow direction information and the presence of possible alternate contributors, the 1997 groundwater sampling data are not sufficient to attribute a release of VOCs to the VGC site.

Although the BKK Carson Dump was a Class II landfill permitted to accept household and industrial waste, there are no records to document the types of materials actually deposited in the landfill. In addition, there are no records to document the types of materials actually deposited in the public dump that occupied the southwest portion of the site.

In December 1996, the DTSC, under contract to the EPA, conducted a Hydropunch™ soil sampling effort at the VGC site. The eight sampling locations (SS-1 through SS-8) are shown in Figure 2. Soil samples were collected from depths of 10 feet below ground surface (bgs) and 20 feet bgs at each location. VOCs (i.e., acetone, 2-butanone, benzene, chlorobenzene, ethylbenzene, 4-methyl-2-butanone, toluene, and xylene) were detected at elevated concentrations at sampling locations SS-7 and SS-8. However, the analytical results may not meet quality assurance/quality control (QA/QC) requirements. Semivolatiles [4-methylphenol, naphthalene, phenanthrene, and bis (2-ethylhexyl) phthalate] were detected at elevated concentrations at sampling location SS-7. Metals (i.e., cadmium, chromium, lead, mercury, and zinc) were detected at elevated concentrations at sampling locations SS-2 and SS-7. The semivolatile and metals data appear to meet QA/QC requirements.

Table 2 presents toxicity/mobility factor values for all hazardous substances that were detected at elevated concentrations in either groundwater or soil during the December 1996 and January 1997 DTSC sampling events, regardless of whether the analytical data are usable for HRS purposes. As shown in the table, the only hazardous substance that yields a toxicity/mobility factor value of 10,000 is vinyl chloride.

- Aquifer Interconnection: Aquifer interconnection is established between the Bellflower aquifer and the underlying Gage, Lynwood, and Silverado aquifers within 2 miles of the VGC site. While all four of these water-bearing units are designated as aquifers by the California Regional Water Quality Control Board, the Lynwood and Silverado aquifers constitute the principal municipal drinking water supply for the region. Currently available information appears to be sufficient to document aquifer interconnection.

Groundwater sampling data are available to establish interconnection between the Bellflower, Gage, and Lynwood aquifers within 2 miles of the VGC site. The Montrose National Priorities List site is located approximately 1 mile west of the VGC site (see Figure 1). As reported in the October 29, 1992 Montrose Site Final Draft RI report, which was prepared by Hargis + Associates, Inc., chlorobenzene and para-chlorobenzene

Table 2: Groundwater Toxicity/Mobility Factor Values**TDD: 09-9911-0004
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Hazardous Substance	Toxicity	Groundwater Mobility	Toxicity/Mobility
vinyl chloride	10,000	1	10,000
1,1-DCA	10	1	10
1,2-DCE (total)	100	1	100
1,2-DCA	100	1	100
TCE	10	1	10
acetone	10	1	10
2-butanone	not in SCDM		
benzene	100	1	100
chlorobenzene	100	1	100
ethylbenzene	10	1	10
4-methyl-2-butanone	not in SCDM		
toluene	10	1	10
xylene	10	1	10
4-methylphenol	not in SCDM		
naphthalene	100	1	100
phenanthrene	not determined	0.01	cannot be determined
bis (2-ethylhexyl) phthalate	100	0.0001	0.01
cadmium	10,000	0.01	100
chromium	10,000	0.01	100
lead	10,000	0.01	100
mercury	10,000	0.01	100
zinc	10	0.01	0.1

sulfonic acid (p-CBSA) have been detected at elevated concentrations in monitoring wells screened solely in the Bellflower, the Gage, and the Lynwood aquifers in the vicinity of the Montrose site. These two contaminants are associated with past dichlorodiphenyltrichloroethane (DDT) manufacturing operations at the Montrose site.

Stratigraphic information is available in the June 1961 State of California Department of Water Resources Bulletin No. 104, Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, to establish interconnection between the Lynwood and Silverado aquifers within 2 miles of the VGC site. The VGC site is located approximately 1.75 miles northeast of the coastal area where merging of the Lynwood and Silverado aquifers is known to occur (see page 75 and Plate 20 in Bulletin No. 104).

- Groundwater Targets Factor Category Value of 754.7: Given an observed release and a toxicity/mobility factor value of 10,000, a targets factor category value of at least 470 is needed to yield a site score of 50 (see Scenario #7). Available information appears to be sufficient to document a targets factor category value of at least 470. Population apportionment calculations for the 1994 SIP and the 1998 DTSC ESI resulted in assigned targets factor category values of 789.5 and 754.7, respectively. Both these values are significantly greater than 470, but will need to be updated and confirmed.

Scenarios #8 and #9 (Air Pathway)

- Observed Release to Air: In July 1988, SCS Engineers, under contract to the County of Los Angeles, Facilities Management Division, conducted an outdoor ambient air sampling effort at the VGC site, as part of an Air Solid Waste Assessment Test (SWAT). Prior to the sampling event, a 1-day meteorological survey was conducted to determine wind flow patterns. Winds were found to be predominantly from the west-northwest, west, and west-southwest directions. One 24-hour air sampling station was placed upwind of the site and one was placed downwind. In addition, one less-than-24-hour air sampling station (samples were collected during the night-time hours only) was placed upwind of the site and one was placed downwind. The exact locations of sampling stations are unknown, since the sample location map ("Site Plan" in Appendix A) is missing from the copy of the November 1988 Air SWAT report that is in the CERCLA files. A total of 15 samples [13 ambient air samples (including one duplicate), one trip blank, and one field blank] were collected from the sampling stations on July 21, 25, and 27, 1988. The samples were analyzed for vinyl chloride only. Wind speed and direction were continuously monitored during the air sampling period. Winds were predominantly from the west and west-northwest (see pages 15 through 18 of the November 1988 Air SWAT report). Vinyl chloride was not detected in either the downwind 24-hour or upwind less-than-24-hour samples. However, vinyl chloride was detected at concentrations ranging from non-detect to 2.4 parts per billion (ppb) in the downwind less-than-24-hour samples and at concentrations ranging from non-detect to 4.5 ppb in the upwind 24-hour samples. The

results of the July 1988 ambient air sampling effort are inconclusive and, as such, are not sufficient to document an observed release to air from the VGC site.

- Toxicity/Mobility Factor Value of 10,000: The landfill and, presumably, the public dump are covered with at least 3 feet of "clean" fill and are substantially vegetated with little exposed soil. These conditions yield a particulate containment factor value of 0. Therefore, the metals detected during the 1996 DTSC soil sampling effort are not included as hazardous substances for the air pathway. During the 1988 Air SWAT, SCS Engineers collected integrated surface samples of gas from the landfill. Methane, vinyl chloride, benzene, ethylene dichloride, methylene chloride, TCE, and tetrachloroethene (PCE) were detected in these samples. While the analytical data from the 1988 Air SWAT integrated surface sampling effort probably do not meet QA/QC requirements for establishing the presence of hazardous substances in the landfill, they do provide evidence of a biogas release (i.e., methane migration from the surface of the landfill). The VOCs and semivolatiles detected in the December 1996 DTSC soil samples can, therefore, be considered hazardous substances for the air pathway evaluation.

Table 3 presents toxicity/mobility factor values for all hazardous substances that were detected at elevated concentrations during either the 1988 integrated landfill gas surface sampling effort or the 1996 soil sampling effort, regardless of whether the analytical data are usable for HRS purposes. As shown in Table 3, the only hazardous substance that yields a toxicity/mobility factor value of 10,000 is vinyl chloride.

- Air Targets Factor Category Value of 472.4 or 959.3: If a release to air is documented within the "on a source" distance ring, the 228 residents of the Don Dominguez Apartments, 10 employees at the Victoria Golf Course, and 30 employees at the Goodyear Airship Operations Center have the potential for being subject to at least Level II concentrations, depending on whether or not they are located on top of historic disposal areas. Adding in a nearest individual factor value of 45, a potential contamination factor value of 154.4, and a resources factor value of 5, the targets factor category would be assigned a value of 472.4 (Scenario #8). If a release to air is documented within the "0 to 0.25-mile" distance ring, the approximately 500 students and teachers at Towne Avenue Elementary School could also potentially be subject to at least Level II concentrations, depending on whether or not they are located within 0.25 mile of historic disposal areas. Adding in a nearest individual factor value of 45, a potential contamination factor value of 141.3, and a resources factor value of 5, the targets factor category would be assigned a value of 959.3 (Scenario #9). The boundaries of the source(s) will need to be delineated (e.g., the locations of the waste disposal trenches in the landfill area to the northeast of the current San Diego Freeway) to determine the number of residents, workers, students, and teachers that are on or within 0.25 mile of the source(s).

Table 3: Air Toxicity/Mobility Factor Values**TDD: 09-9911-0004**
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Hazardous Substance	Toxicity	Air Gas Mobility	Toxicity/Mobility
vinyl chloride	10,000	1	10,000
benzene	100	1	100
ethylene dichloride	not in SCDM		
methylene chloride	10	1	10
TCE	10	1	10
PCE	100	1	100
acetone	10	1	10
2-butanone	not in SCDM		
chlorobenzene	100	1	100
ethylbenzene	10	1	10
4-methyl-2-butanone	not in SCDM		
toluene	10	1	10
xylene	10	1	10
4-methylphenol	not in SCDM		
naphthalene	100	0.2	20
phenanthrene	not determined	0.02	cannot be determined
bis (2-ethylhexyl) phthalate	100	0.002	0.2

Proposed Additional Information/Sampling Needs

- Documentation of an Observed Release to the Bellflower Aquifer:

- 1) Contact the LA County DPR [current owners of the majority of the site (Victoria Regional Park)] to determine if any groundwater sampling has occurred since the January 1997 DTSC Hydropunch™ effort or if any is planned, possibly as part of a Groundwater SWAT. The following contacts are listed in the 1994 BEI SIP for the LA County DPR: Tom Dittmar [(213)738-2974], Peter Bogue (phone number not known), and Jim Park [(213)738-2965]. Tom Dittmar and Peter Bogue represented the County during BEI's February 23, 1994 SIP Site Reconnaissance.

If the LA County DPR has not recently collected HRS-quality groundwater data and is not planning to do so, then:

- 2) Obtain locations, screening intervals, water level measurements, and analytical results for existing monitoring wells in the vicinity of the site (e.g., monitoring wells at the Southwest Conservation Landfill and Cal Compact Landfill).
- 3) Review the aerial photographs in the CERCLA files to confirm the boundaries of the historic waste disposal areas within the landfill and public dump areas (U.S. EPA, Environmental Monitoring Systems Laboratory, August 1989, Aerial Photographic Analysis of the BKK Carson Dump).
- 4) Install at least six groundwater monitoring wells, screened in the Bellflower aquifer, along the perimeter of the former landfill and public dump areas to determine groundwater flow direction, whether hazardous substances are present at concentrations significantly above background in the downgradient well(s), and whether at least a portion of the significant increase is attributable to the VGC site.

- Documentation of an Observed Release to Air:

- 1) Contact the LA County DPR to determine if a) any outdoor ambient air sampling has been conducted since the July 1988 Air SWAT; b) a landfill gas collection system to control offsite methane migration has been installed at the site [the LA County DPR submitted plans for a gas collection system to the South Coast Air Quality Management District in about 1994]; and c) analytical data are available from gas extraction well and flare station sampling, if a gas collection system has been installed. The following contacts are listed in the 1994 BEI SIP for the LA County DPR: Tom Dittmar [(213)738-2974], Peter Bogue (phone number not known), and Jim Park [(213)738-2965].

If recent HRS-quality outdoor ambient air sampling data are not available and a fully functioning landfill gas collection system has not been installed at the site, then:

- 2) Review the aerial photographs in the CERCLA files to confirm the boundaries of the historic waste disposal areas within the landfill and public dump areas (U.S. EPA, Environmental Monitoring Systems Laboratory, August 1989, Aerial Photographic Analysis of the BKK Carson Dump).
 - 3) Install 24-hour continuous ambient air sampling and meteorological stations to determine wind direction, whether hazardous substances are present at concentrations significantly above background at the downwind stations(s), and whether at least a portion of the significant increase is attributable to the VGC site.
- Assignment of a Toxicity/Mobility Factor Value of 10,000:
 - 1) Contact the LA County DPR to determine if they have conducted any landfill gas sampling for specific VOCs since the 1988 Air SWAT. The recent presence of VOCs in the landfill gas may be a good indication of the potential for detecting VOCs during a future soil gas sampling effort. The following contacts are listed in the 1994 BEI SIP for the LA County DPR: Tom Dittmar [(213)738-2974], Peter Bogue (phone number not known), and Jim Park [(213)738-2965].
 - 2) Contact the Los Angeles County Department of Public Works (LA County DPW) to obtain recent results from their ongoing methane migration monitoring program at the VGC site. The presence of methane gas in the landfill may be a good indication of the potential for detecting VOCs during a future soil gas sampling effort. The following contact is listed in the 1994 BEI SIP for the LA County DPW: Mike Mohajer [(818)458-3502].
 - 3) Collect soil gas samples to provide further documentation to support attribution of the projected releases to groundwater and air.
 - Targets:
 - 1) Contact water purveyors to update population data for drinking water wells within 4 miles of the site.
 - 2) After delineating the source(s), determine which nearby air targets are in the "on a source" distance ring and which are in the "0- to 0.25-mile" distance ring.

- Miscellaneous:

- 1) Los Angeles County is reportedly preparing a risk assessment for the VGC site. When talking to representatives from the LA County DPR and DPW, find out who is preparing this risk assessment and its content. This document could be a good source of recent information for targets, existing sampling data, and public concerns.

Other Pathways

The Surface Water Pathway does not contribute significantly to the overall site score because the nearest surface water bodies are concrete-lined and used exclusively for flood control purposes.

The Soil Exposure Pathway does not contribute significantly to the overall site score because soil sampling within 2 feet of ground surface has not been conducted within the boundaries of the landfill, public dump, or Towne Avenue Elementary School. It is unlikely that a future sampling event would detect VOCs in surface soils on the VGC site because the landfill and, presumably, the public dump have been covered with three feet of clean fill. Although the potential exists for offsite migration of landfill contaminants to the school property via landfill gas migration, the HRS does not allow for the use of soil gas sampling data to document observed contamination.

HRS Scoring Analysis Matrix					
Victoria Golf Course Site Carson, California CAD980818926					
Scoring Scenario	Likelihood of Release	Waste Character- istics	Targets	Pathway Score	Site Score
1. As scored by E & E for the 1998 DTSC ESI: <u>Groundwater Pathway</u> (potential to release, projected toxicity/mobility factor value of 10,000 for vinyl chloride, and documented potential contamination factor value of 745.7)	410	32	754.7	100	50
2. As scored by BEI for the 1994 SIP: <u>Groundwater Pathway</u> (projected observed release, projected toxicity/mobility factor value of 10,000 for vinyl chloride, and documented potential contamination factor value of 775.5) <u>Air Pathway</u> [potential to release, projected toxicity/mobility factor value of 10,000 for vinyl chloride, and documented potential contamination for the 358 people regularly occupying buildings or areas on the former BKK Carson Dump in the "on a source" distance ring (i.e., 228 residents at the Don Dominguez Apartments; 90 golfers and 10 employees at the Victoria Golf Course; and 30 employees at the Goodyear Airship Operations Center) and 492 students at the Towne Avenue Elementary school in the "0 to 0.25-mile" distance ring]	550 500	32 32	789.5 231.61	100 44.91	 54.81
3. <u>Groundwater Pathway</u> (obtain data to document an observed release, obtain data to document a toxicity/ mobility factor value of 100, and confirm 1998 DTSC ESI targets factor category value of 754.7)	550	10	754.7	50.31	25.16

HRS Scoring Analysis Matrix					
Victoria Golf Course Site Carson, California CAD980818926					
Scoring Scenario	Likelihood of Release	Waste Character- istics	Targets	Pathway Score	Site Score
4. Groundwater Pathway (assuming an observed release and a toxicity/mobility factor value of 100, this scenario presents the minimum targets factor value that would be required to yield a site score of 28.5)	550	10	855	57	28.5
5. Groundwater Pathway (obtain data to document an observed release, obtain data to document a toxicity/ mobility factor value of 1000, and confirm 1998 DTSC ESI targets factor category value of 754.7)	550	18	754.7	90.56	45.28
6. Groundwater Pathway (obtain data to document an observed release, obtain data to document a toxicity/ mobility factor value of 10,000, and confirm 1998 DTSC ESI targets factor category value of 754.7)	550	32	754.7	100	50
7. Groundwater Pathway (Assuming an observed release and toxicity/mobility factor value of 10,000, this scenario presents the minimum targets factor category value that would be required to yield a site score of 50)	550	32	470	100	50
8. Air Pathway [delineate source(s), obtain data to document an observed release within the boundaries of the source(s), obtain data to document a toxicity/mobility factor value of 10,000, and assign at least Level II concentrations to the 268 residents/workers in the "on a source" distance ring]	550	32	472.4	100	50

HRS Scoring Analysis Matrix					
Victoria Golf Course Site Carson, California CAD980818926					
Scoring Scenario	Likelihood of Release	Waste Character- istics	Targets	Pathway Score	Site Score
9. Air Pathway [delineate source(s), obtain data to document an observed release within the boundaries of the source(s) and Towne Avenue Elementary School, obtain data to document a toxicity/mobility factor value of 10,000, and assign at least Level II concentrations to the 268 residents/workers in the "on a source" distance ring, and the 500 student/teachers at Towne Avenue Elementary School in the "0- to 0.25-mile" distance ring)	550	32	959.3	100	50



Source	Local Facility*	VOCs with Elevated Concentrations in Groundwater
A	Amoco/Del Amo (?)	TCE, PCE, chloroform
B	International Light Metals	TCE
C	International Light Metals/ McDonnell Douglas	TCE
D	International Light Metals	TCE, PCB, 1,1-DCE, 1,1-DCA
E	McDonnell Douglas	1,1-DCE, toluene, benzene, TCE, 1,1,1-TCA
F	Trico	1,1-DCA, TCE, PCE, vinyl chloride
G	Penske Truck Leasing	benzene
H	Mobil Oil Refinery	BTEX
I	Allied Signal	1,1-DCE, 1,1-DCA, 1,1,1-TCA, benzene
J	Jones Chemical	TCE, PCE, 1,1-DCE
K	XMW-07 LNAPL	BTEX, 1,1-DCA
L	Jones Chemical	TCE, PCE, benzene, 1,1-DCE, 1,1-DCA
M	Montrose	chlorobenzene, p-CBSA, chloroform
N	unknown	BTEX, TCE, 1,2-DCA, 1,2,4-trimethylbenzene
O	unknown	benzene
P	P-1 LNAPL Pipeline leakage?	benzene, naphthalene
Q	Azko	toluene
R	Armco	BTEX, chlorobenzene, p-CBSA
S	Gardena Valley Landfill	benzene, PCE, TCE, vinyl chloride
T	Cal Compact Landfill	vinyl chloride, TCE, PCE, cis-1,2-DCE, benzene
U	Cal Compact Landfill	BTEX
V	Golden Eagle Refinery	BTEX
W	Golden Eagle Refinery	vinyl chloride, cis-1,2-DCE, TCE, PCE
X	Southwest Conservation Landfill	PCE, TCE, 1,1-DCA, vinyl chloride
Y	Boring SBL0102 LNAPL Pipeline leakage?	groundwater not tested

* Indicates only the name of the local facility at the time the analytical data was collected and does not necessarily reflect responsibility for the contamination present

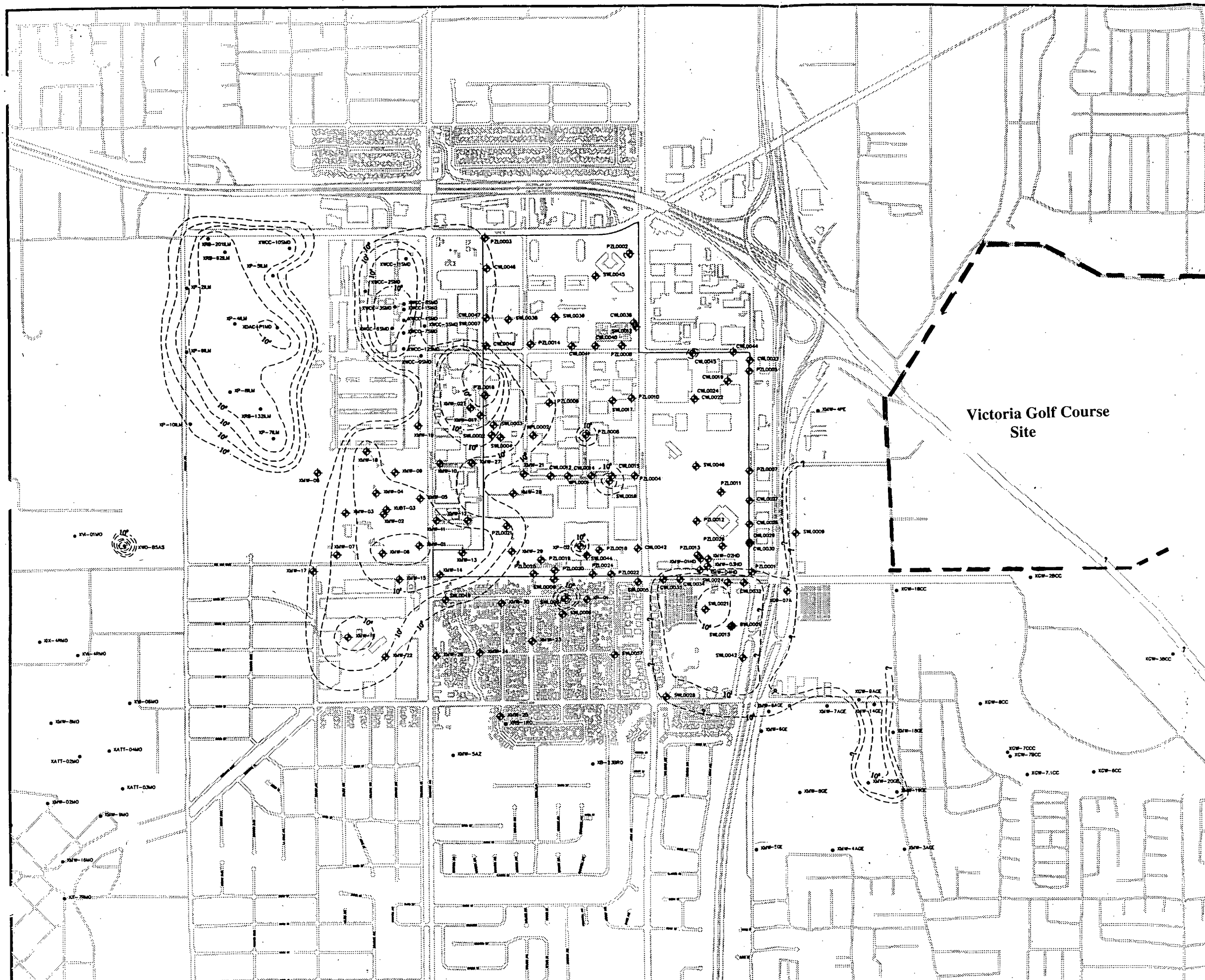
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FIGURE 5.3-1

Regional Groundwater Contamination
Source Areas

Groundwater Remedial Investigation Report
Del Amo Study Area

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EXPLANATION

- ◆ PZL0016 Del Amo/Montrose monitoring location.
- XWO-BSAS Monitoring location identified in regulatory agency files.
- - - 10⁰ Tri- and tetra- chlorinated compound concentration isopleth in µg/L.

NOTES:

Tri- and Tetra- Chlorinated Compounds include 111-TCA, TCE, PCE, 1,1,2,2-Tetrachloroethane, and 112-TCA. Concentration isopleths from input to groundwater model.

Concentration isopleths near southeast corner of plant site inferred from concentration data and boundaries of inactive landfills in this area.

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FIGURE 5.3-3

Regional Tri- and Tetra-
Chlorinated Compound Concentrations
Water Table Zone

Groundwater Remedial Investigation
Del Amo Study Area

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